Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1. **(Currently Amended)** Method of delivering data from a data input to a data output within a system, comprising

selecting a system performance parameter to be optimized in a system that allows data to be delivered in at least three different modes,

receiving at the data input a sequence of discrete data words,

determining an optimum mode of delivery of the data words to the data output so as to optimize the selected performance parameter, and

delivering the data words from the data input to the data output in the determined optimum mode, wherein:

when the selected performance parameter to be optimized is latency, the optimum mode comprises delivering each data word ~~as soon as possible~~ immediately after the data word is received at the data input;

when the selected performance parameter to be optimized is bandwidth, the optimum mode comprises holding at least one of the data words first received at the data input in storage until additional data words comprising the data packet are received at the data input, delivering the data words from storage to the data output as the additional data words comprising the data packet are received at the data input with minimal time gaps between the data words, and delivering the additional data words ~~substantially~~ directly

from the data input to the data output ~~as soon as possible~~ immediately after the additional data words are received at the data input; and

when the performance parameter to be optimized is safety, the optimum mode comprises holding each of the data words received in storage until all data words comprising the data packet have been received, and delivering the data words from storage to the data output with ~~substantially~~ no time gaps between the data words.

2. Canceled

3. (Original) Method according to claim 1, further comprising reordering the data words into a desired sequence before delivering the data words from the data input to the data output.

4. **(Currently Amended)** Method of delivering data from a data input to a data output within a system, comprising

selecting a system performance parameter to be optimized in a system that allows data to be delivered in at least three different modes,

receiving at the data input a sequence of discrete data words,

selecting a desired sequence of the data words; and

delivering the data words from the data input to the data output in the determined optimum sequence and time, wherein:

when the selected performance parameter to be optimized is latency, the optimum mode comprises delivering each data word in the desired sequence ~~as soon as possible~~ immediately after the data word is received at the data input;

when the selected performance parameter to be optimized is bandwidth, the optimum mode comprises holding at least one of the data words first received at the data input in storage until additional data words comprising the data packet are received at the data input, delivering the data words in the desired sequence from storage to the data output as the additional data words comprising the data packet are received at the data input with minimal time gaps between the data words, and delivering the additional data words in the desired sequence ~~as soon as possible~~ immediately after the additional data words are received at the data input; and

when the performance parameter to be optimized is safety, the optimum mode comprises holding each of the data words received in storage until all data words comprising the data packet have been received, and delivering the data words from storage to the data output in the desired sequence with ~~substantially~~ no time gaps between the data words.

5. **(Withdrawn, currently amended)** Method of delivering data from a data input to a data output within a system, comprising

receiving at the data input a sequence of discrete data words, and

delivering each data word to the data output without regard to sequence and ~~as soon as possible~~ immediately after the data word is received at the data input, whereby latency is minimized.

6. (Withdrawn) Method according to claim 5, further comprising arranging the data words into a preselected sequence before delivering the data words to the data output.

7. **(Withdrawn, currently amended)** Method of delivering data from a data input to a data output within a system, comprising

receiving at the data input a sequence of discrete data words,

holding at least one of the data words first received at the data input in storage until additional data words comprising the data packet are received at the data input,

delivering the data words from storage to the data output as the additional data words comprising the data packet are received at the data input with minimal time gaps between said data words, and

delivering the additional data words ~~substantially~~ directly from the data input to the data output ~~as soon as possible~~ immediately after the additional data words are received at the data input, whereby bandwidth is maximized.

8. (Withdrawn) Method according to claim 7, further comprising arranging the data words into a preselected sequence before delivering the data words to the data output.

9. **(Withdrawn, currently amended)** Method of delivering data from a data input to a data output within a system, comprising

receiving at the data input a sequence of discrete data words comprising a data packet,

holding each of the data words received in storage until all data words comprising the data packet have been received, and

delivering the data words from storage to the data output in the preselected sequence and with ~~substantially~~ no time gaps between the data words, whereby safety is maximized.

10. (Withdrawn) Method according to claim 9, further comprising arranging the data words into a preselected sequence before delivering the data words from storage to the data output.

11. **(Currently Amended)** Method of delivering data from a data input to a data output within a data processing system that allows data to be delivered in at least three different modes on each of a plurality of multiplexed data channels, comprising

selecting a system performance parameter to be optimized for each channel,

receiving at the data input of each channel a sequence of discrete data words,

determining an optimum mode of delivery of the data words to the data output so as to optimize the selected performance parameter for the associated channel, and

delivering the data words from the data input to the data output in the determined optimum mode for each channel, wherein:

when the selected performance parameter to be optimized is latency, the optimum mode comprises delivering each data word ~~as soon as possible~~ immediately after the data word is received at the data input;

when the selected performance parameter to be optimized is bandwidth, the optimum mode comprises holding at least one of the data words first received at the data

input in storage until additional data words comprising the data packet are received at the data input, delivering the data words from storage to the data output as the additional data words comprising the data packet are received at the data input with minimal time gaps between the data words, and delivering the additional data words ~~substantially~~ directly from the data input to the data output ~~as soon as possible~~ immediately after the additional data words are received at the data input; and

when the performance parameter to be optimized is safety, the optimum mode comprises holding each of the data words received in storage until all data words comprising the data packet have been received, and delivering the data words from storage to the data output with ~~substantially~~ no time gaps between the data words.

12. (Original) Method according to claim 11, wherein the mode of delivery is different for at least two of the plurality of data channels.

13. **(Currently Amended)** Method of delivering data from a plurality of data sources from a data input to a data output within a data processing system that allows data to be delivered in at least three different modes for each data source, the method comprising

selecting a system performance parameter to be optimized for each source,

receiving at the data input a sequence of discrete data words in transit to the data output from each source,

determining an optimum mode of delivery of the data words to the data output so as to optimize the selected performance parameter for the associated source, and

delivering the data words from the data input to the data output in the determined optimum mode for each source, wherein:

when the selected performance parameter to be optimized is latency, the optimum mode comprises delivering each data word ~~as soon as possible~~ immediately after the data word is received at the data input;

when the selected performance parameter to be optimized is bandwidth, the optimum mode comprises holding at least one of the data words first received at the data input in storage until additional data words comprising the data packet are received at the data input, delivering the data words from storage to the data output as the additional data words comprising the data packet are received at the data input with minimal time gaps between the data words, and delivering the additional data words ~~substantially~~ directly from the data input to the data output ~~as soon as possible~~ immediately after the additional data words are received at the data input; and

when the performance parameter to be optimized is safety, the optimum mode comprises holding each of the data words received in storage until all data words comprising the data packet have been received, and delivering the data words from storage to the data output with ~~substantially~~ no time gaps between the data words.

14. (Original) Method according to claim 13, wherein the mode of delivery is different for at least two of the plurality of data sources.

15. (Withdrawn) Apparatus for delivering data from a data input to a data output within a system to optimize a selected system parameter, comprising

a data input for receiving a sequence of discrete data words,

a data output to which data are delivered, and

at least one data storage element intermediate the data input and data output for storing individual data words for a determined time before delivery to the data output, and at least one path for selectably delivering data to the data output by bypassing said data storage element.

16. (Withdrawn) Apparatus according to claim 15, wherein the data storage element is a register.

17-19. Canceled

20. (Previously Presented) Apparatus for delivering data from a data input to a data output within a system using the method of claim 1, comprising:

a data input for receiving a sequence of discrete data words from a plurality of data sources including a link input having unpredictable data arrival times and a memory having predictable data arrival times;

a data output to which data are delivered; and

at least one data storage element intermediate the data input and data output for storing individual data words in transit from the data input to the data output for a determined time before delivery to the data output, and at least one path for selectably delivering data to the data output by bypassing said data storage element.

21. (Withdrawn) Apparatus for delivering data within a system in accordance with the method of claim 1, comprising:

a first synchronizer for receiving a first sequence of discrete data words from a link input having unpredictable data arrival times and for synchronizing the received data between different clock domains;

a first queue for receiving the first sequence of discrete data words from the link input and a second sequence of discrete data words from a memory;

a second queue connected to a processor, intermediate the first queue and a first multiplexer, and a first path for selectably delivering data to the first multiplexer by bypassing the second queue and the processor, wherein the first multiplexer is for combining data from the first queue and the processor into a single time division multiplexed (TDM) data stream and the processor is for providing select packet processing;

a second synchronizer connected to the first multiplexer for synchronizing data between different clock domains; and

a data storage element intermediate the second synchronizer and a second multiplexer, for storing individual data words in transit from the second synchronizer to the second multiplexer for a determined time before delivery to the second multiplexer, so that data words can be read out in a predetermined order, and a second path for selectably delivering data to the second multiplexer by bypassing the data storage element, wherein the second multiplexer is for combining data from the storage unit and the second synchronizer into a single TDM data stream.